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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,838	06/27/2006	Kristof Van Reck	NL040058	1200

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EXAMINER	
KURR, JASON RICHARD	
ART UNIT	PAPER NUMBER
2614	
MAIL DATE	DELIVERY MODE
08/27/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/596,838	VAN RECK, KRISTOF	
	Examiner	Art Unit	
	JASON R. KURR	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 August 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 11, 2009 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 11, 13-19, and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Aarts et al (US 6,111,960).

With respect to claim 1, Aarts discloses a method of enhancing an audio signal, the method comprising the steps of: filtering, using a filter unit (fig.5 #20), the audio signal so as to select a frequency range thereby forming a filtered audio signal (col.4 ln.60-62); dividing, using a segmenting unit (fig.5 #240), the filtered audio signal of the selected frequency range into time segments thereby forming filtered audio signal

segments (col.7 ln.15-19); and scaling, using a scaling unit (fig.5 #241) each of the filtered audio signal segments so as to increase the sound level of the filtered audio signal (col.6 ln.63-67,col.7 ln.1-24), wherein the time segments are defined by zero crossings of the filtered audio signal.

With respect to claim 2, Aarts discloses the method as claimed in claim 1, wherein each time segment is defined by two consecutive zero crossings of the filtered audio signal (col.7 ln.17-19).

With respect to claim 3, Aarts discloses the method as claimed in claim 1, wherein the step of scaling the audio signal involves a distinct scaling factor for each time segment (col.7 ln.17-19).

With respect to claim 4, Aarts discloses the method as claimed in claim 1, wherein the step of scaling involves a scaling factor which is constant for each time segment (col.7 ln.3-6).

With respect to claim 5, Aarts discloses the method as claimed in claim 1, wherein the step of scaling involves a scaling factor which varies with the amplitude of the filtered audio signal (col.7 ln.21-24).

With respect to claim 6, Aarts discloses the method as claimed in claim 5, wherein the step of scaling involves a non-linear scaling factor involving a quadratic or cubic function (col.1 ln.40-43).

With respect to claim 7, Aarts discloses the method as claimed in claim 1, wherein said method further comprises the step of: combining, in a combination unit, the scaled filtered audio signal segments of the selected frequency range and the

remainder of the audio signal not in the selected frequency range, thereby forming a combined audio signal (fig.5 #26).

With respect to claim 11, Aarts discloses the method as claimed in claim 1, wherein the selected frequency range is a bass frequency range (col.4 ln.50-51).

With respect to claim 13, Aarts discloses a device for enhancing an audio signal, the device comprising: filter means (fig.5 #20) for filtering the audio signal so as to select a frequency range (col.4 ln.60-62) thereby forming a filtered audio signal; dividing means (fig.5 #240) for dividing the filtered audio signal of the selected frequency range into time segments (col.7 ln.15-19) thereby forming filtered audio signal segments; and scaling means (fig.5 #241) for scaling each of the filtered audio signal so as to increase a sound level of the filtered audio signal (col.6 ln.63-67,col.7 ln.1-24), wherein the time segments are defined by zero crossings of the filtered audio signal.

With respect to claim 14, Aarts discloses the device as claimed in claim 13, wherein the dividing means defines each time segment by two consecutive zero crossings of the filtered audio signal (col.7 ln.17-19).

With respect to claim 15, Aarts discloses the device as claimed in claim 13, wherein the scaling means uses a distinct scaling factor for each time segment (col.7 ln.13-15).

With respect to claim 16, Aarts discloses the device as claimed in claim 13, wherein the scaling means uses a scaling factor which is constant for each time segment (col.7 ln.3-6).

With respect to claim 17, Aarts discloses the device as claimed in claim 13, wherein the scaling means uses a scaling factor which varies with the amplitude of the filtered audio signal (col.7 ln.21-24).

With respect to claim 18, Aarts discloses the device as claimed in claim 17, wherein the scaling means uses a non-linear scaling factor involving a quadratic or cubic function (col.1 ln.40-43).

With respect to claim 19, Aarts discloses the device as claimed in claim 13, wherein said device further comprises: combining means (fig.5 #26) for combining the scaled filtered audio signal segments and the remainder of the audio signal not in the selected frequency range, thereby forming a combined audio signal.

With respect to claim 25, Aarts discloses an audio amplifier (fig.7) comprising a device as claimed in claim 13.

With respect to claim 26, Aarts discloses an audio system (fig.5) comprising a device as claimed in claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts et al (US 6,111,960) in view of Townsend et al (US 6,606,388 B1).

With respect to claim 12, Aarts discloses the method as claimed in claim 1, however does not disclose expressly wherein said method further comprises the step of: delaying, in a delay unit, any signal components of the audio signal in frequency ranges other than said selected frequency range.

Townsend discloses a method for enhancing audio signals comprises the step of: delaying any signal components of the audio signal in frequency ranges other than said selected frequency range (fig.2 #226, col.5 ln.4-7). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the delay of Townsend to delay the non-selected frequency portions of Aarts. The motivation for doing so would have been to ensure the alignment of the audio signals when combined in the time domain.

With respect to claim 24, Aarts discloses the device as claimed in claim 13, however does not disclose expressly wherein said device further comprises: a delay element for delaying signal components of the audio signal in frequency ranges other than said selected frequency range.

Townsend discloses a device for enhancing audio signals comprises a delay element for delaying any signal components of the audio signal in frequency ranges other than said selected frequency range (fig.2 #226, col.5 ln.4-7). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the delay of Townsend to delay the non-selected frequency portions of Aarts. The

motivation for doing so would have been to ensure the alignment of the audio signals when combined in the time domain.

Claims 8-10 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aarts et al (US 6,111,960) in view of Roberts (US 5,509,080).

With respect to claim 8, Aarts discloses the method as claimed in claim 7, however does not disclose expressly wherein said method further comprises the steps of: comparing, using a comparator, an amplitude of the combined audio signal with a threshold value; and adjusting, using an adjusting unit, the amplitude of the combined audio signal if the threshold is exceeded.

Roberts discloses a comparison means (fig.1 #62,64) for comparing a signal to a selected voltage level (col.2 ln.49-57), and adjusting means (fig.1 #32) for adjusting the low frequency portion of the signal in the event that the signal exceeds the selected voltage level (col.2 ln.59-67, col.3 ln.1-7). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the circuit of Roberts on the output of the combiner of Aarts. The motivation for doing so would have been to protect an attached subwoofer from damaging signal levels while maintaining full fidelity in the bass signal range.

With respect to claim 9, Aarts discloses the method as claimed in claim 8, wherein only the amplitude of the filtered audio signal is adjusted (Roberts: col.2 ln.64-67).

With respect to claim 10, Aarts discloses the method as claimed in claim 8, wherein the steps of comparing the amplitude of the combined audio signal and adjusting the amplitude of the combined audio signal is carried out per time segment. It is understood that the low frequency harmonics created by Aarts occur within the time period of the zero-crossing of the audio signal, thus the low frequency portion of the signal that is forwarded to the circuit of Roberts maintains this time period relationship.

With respect to claim 20, Aarts discloses the device as claimed in claim 19, however does not disclose expressly wherein said device further comprises: comparing means for comparing an amplitude of the combined audio signal with a threshold value; and adjusting means for adjusting the amplitude of the combined audio signal if the threshold is exceeded. Roberts discloses a comparison means (fig.1 #62,64) for comparing a signal to a selected voltage level (col.2 ln.49-57), and adjusting means (fig.1 #32) for adjusting the low frequency portion of the signal in the event that the signal exceeds the selected voltage level (col.2 ln.59-67, col.3 ln.1-7). At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the circuit of Roberts on the output of the combiner of Aarts. The motivation for doing so would have been to protect an attached subwoofer from damaging signal levels while maintaining full fidelity in the bass signal range.

With respect to claim 21, Aarts discloses the device as claimed in claim 20, wherein the adjusting means adjusts only the amplitude of the filtered audio signal (Roberts: col.2 ln.64-67).

With respect to claim 22, Aarts discloses the device as claimed in claim 20, wherein the comparing means compares the amplitude of the combined audio signal per time segment, and the adjusting means adjusts the amplitude of the combined audio signal per time segment. It is understood that the low frequency harmonics created by Aarts occur within the time period of the zero-crossing of the audio signal, thus the low frequency portion of the signal that is forwarded to the circuit of Roberts maintains this time period relationship.

Response to Arguments

Applicant's arguments filed August 11, 2009 have been fully considered but they are not persuasive.

With respect to claims 1 and 13, the Applicant argues that the cited zero-crossing detector 240 does not anticipate a dividing means because the output of the zero-crossing detector is a detector signal, indicating zero crossings of the audio signal, not divided time segments of the filtered audio signal. The Examiner maintains the position set forth in the Final Rejection dated May 13, 2009. The zero-crossing detector of Aarts receives the frequency selected audio signal, then filters the signal to produce a square wave signal representative of the zero crossings of the audio signal. This is a filtering of the audio signal that produces a divided square wave segments related to the zero-crossings of the audio signal. The square wave signal is a filtered result of the input audio signal to detector 240. The present claim language discloses; “dividing, using a segmenting unit, the filtered audio signal of the selected frequency range into time

segments thereby forming filtered audio signal segments". The present claim language does not disclose wherein the filtered audio signal segments are replicas of the filtered audio signal, therefor the zero-crossings detection of Aarts anticipates the result of a time segmented audio signal as presented by the claim language.

With respect to claims 1 and 13, the Applicant argues that the cited waveform generator 241 does not anticipate the claimed scaling unit. The Examiner disagrees and maintains the position that the waveform generator generates scaled output signals with respect to a level detector 28 (col.6 ln.63-66). The present claim language does not define the claimed scaling as to differentiate from the teachings of Aarts's waveform generator.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to whose telephone number is (571)272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason R Kurr/
Examiner, Art Unit 2614

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614